

Deactivation and Decommissioning Focus Area

Annual Performance Plan

December 1998

Field Program Manager

Host Site Assistant Manager for EM

Headquarters Program Manager

I. Introduction

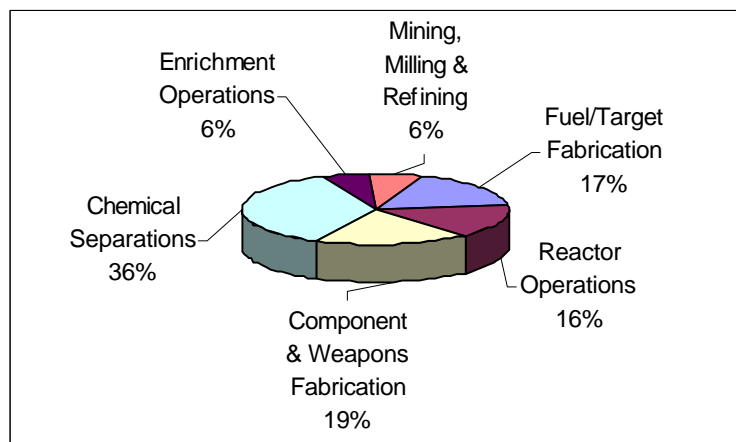
The mission of the Deactivation and Decommissioning Focus Area (DDFA) is to efficiently and cost effectively identify, develop, demonstrate, and assist the deployment of improved deactivation and decommissioning technology systems which reduce costs/mortgages, reduce risks to the workers/public/ environment, and accelerate schedules for the deactivation, decontamination, and decommissioning of DOE's radiologically-contaminated surplus facilities. The DDFA uses a Large-Scale Demonstration and Deployment Project (LSDDP) approach to demonstrate innovative and improved D&D technologies at full scale. This approach focuses on specific, high priority site D&D projects identified by and co-funded with the end-user organization to compare the benefits from using a suite of improved D&D technologies against those associated with baseline technologies. Primary drivers of this work are the reduction of near-term D&D costs/mortgages, the reduction of risk to workers involved in the cleanups, and the recycle (where feasible) or reduction of the large amounts of waste generated from the D&D activities.

Effective deployment of D&D technologies to satisfy the site D&D technical needs could lead to cost savings ranging from \$600 million to \$1.4 billion as projected in the initial estimates from the field sites within the Accelerated Cleanup: Path to Closure Plan (ACPTC; FY98). The overall goal of the Focus Area is to reduce the estimated \$11.3 billion D&D mortgage as reported in the ACPTC by 50 percent (net reduction of \$6 billion). One-third of the estimated \$11.3 billion in D&D work, or approximately \$4 billion, is schedule to occur in the FY1997-2006 period. The Focus Area's goal is to reduce this portion of the mortgage by \$1 billion and the post-2006 mortgage (nearly \$8 billion) by \$5 billion.

This Annual Performance Plan specifies key activities, events, and deliverables for the DDFA in FY99, which will contribute to these goals through demonstration and deployment assistance of alternative technologies at individual sites to reduce risk and cost, and accelerate the cleanup at those sites. This plan is predicated on an FY99 budget of \$23.466 M for the DDFA, which includes the EM Science Program (approximately \$2M for 13 new grants and 9 continuing grants), Crosscutting Programs (\$7.743M), and the Accelerated Site Technology Deployment program (approximately \$5M for 11 new projects).

II. Major Technical Focus for FY 1999-2001

The Deactivation and Decommissioning Focus Area develops, demonstrates, and facilitates the deployment of efficient and cost effective technologies through a series of Large-Scale Demonstration and Deployment Projects. The LSDDPs address real site technical needs pertaining to radiologically contaminated buildings and facilities. The goal is to provide capabilities to deactivate and decommission 90% of the surplus facilities and materials at 50% of the current estimated cost. Beginning in FY 1999, the DDFA has organized its work packages according



to four major Product Lines: Reactor Facilities, Radionuclides Separation Facilities, Fuel and Weapons Component Fabrication Facilities, and Laboratory Facilities. These Product Lines are consistent with the process facility types presented in Linking Legacies (Figure 1).

Figure 1. DOE/EM Surplus Facilities by Weapons Process Category

The Product Line budget for FY 1999 through FY2001 is shown below in Table 1. The DDFA Product Lines and associated D&D work packages are described in the following paragraphs. Detailed work package information can be found in DDFA's FY1999-2003 Multi-Year Program Plan.

Table 1. DDFA Total Program Budget by Product Line, FY99 - FY01 (\$ in millions)

	FY99	FY00	FY01	Totals
Reactor Facilities	6.5	5.9	4.5	16.8
Radionuclide Separation Facilities	4.3	9.5	9.5	23.3
Fuel & Weapons Component Facilities	6.1	7.6	10.0	23.7
Laboratory Facilities	6.4	3.3	3.5	13.3
Totals	23.4	26.2	27.5	77.1

A) Reactor Facilities Product Line

There are 14 surplus production reactors within the DOE weapons complex (Hanford = 9; SRS = 5), which represent a significant portion of the long-term deactivation and decommissioning mortgage. There also exist over 100 test and research reactors throughout DOE (INEEL has more than 50) and U.S. universities that will require D&D. More than half have already been placed in shutdown mode. In addition, the U.S. commercial nuclear utilities have 109 nuclear power plants, and many are approaching their life expectancy (40 year license period) and will require D&D. Improved and innovative D&D technologies are required to achieve lower cost and reduced risk for deactivation and decommissioning of these DOE and commercial reactors. In addition, highly contaminated fuel pools and associated facilities require improved technologies for characterization, decontamination and dismantlement. The following work packages are included in the Reactor Facilities Product Line:

Work Package DD02: Fuel Storage Pools and Associated Structures D&D - Highly contaminated fuel pool and associated facilities require improved technologies for characterization, decontamination, and dismantlement. This work package will demonstrate and deploy underwater visual inspection, characterization and dismantlement technologies as well as technologies for removal and treatment of fuel pool sludges, debris and water. These improved/innovative technologies will reduce the worker risk in high radiation fuel pools and significantly reduce the cost of D&D of these facilities. Technologies demonstrated in this project should substantially assist the future deactivation of fuel pools at INEEL, the Savannah River Site, and the K-basin at Richland. Commercial nuclear utilities, which also face D&D of similar complex facilities, will benefit from this work package. For this reason, the commercial nuclear utility industry will be a key participant and directly involved in this effort. Without these technologies, DOE sites and private industry will be forced to adhere to their original technical baselines which will increase the cost, increase worker risk, and take longer to complete D&D of these facilities. This work package offers approximately \$25 million in potential cost savings and mortgage reduction at INEEL alone. Site-specific needs addressed by this work package are listed in Appendix A.

Work Package DD10: D&D of Production Reactors - This work package will address needs associated with DOE's 14 production reactors at Richland and Savannah River, and those power reactors operated by the commercial nuclear utility industry (109 in the U.S. and over 400 worldwide). Many of these U.S. commercial reactors are approaching the end of

their 40 year licensing period. This work package will address innovative and improved technologies for characterization, decontamination and dismantlement which will result in lower overall cost to D&D these aging facilities, as well as lower the risk to workers involved in the D&D operations. Where opportunities present themselves, improved technologies and systems will be developed and deployed, which facilitate interim safe storage of DOE's production reactors and decommissioning of DOE's research reactors such that long-term surveillance and maintenance requirements are minimized. This work package will leverage RD&D efforts with the Electric Power Research Institute (EPRI) and other members of DOE's Memorandum of Understanding with the commercial utility industry, to identify and address problems common to both DOE and the private sector. Site-specific needs addressed by this work package are listed in Appendix A.

B) Radionuclides Separation Facilities Product Line

Improved, innovative technologies are required to deactivate and decommission radionuclide separation facilities, including gaseous diffusion plants, fuel reprocessing canyons, chemical separation facilities, uranium recycling facilities, lithium enrichment facilities, heavy water production facilities and tritium production facilities. Deactivation and decommissioning activities lead to potential valuable contaminated scrap metal. At present, most of these metals are disposed of as waste since no technologies exist to characterize and/or decontaminate them for free release cost-effectively. Decontamination of metals for recycle and free release, as well as the recycle and reuse of concrete from these facilities, will result in substantial life-cycle cost savings. The following work packages are included in the Radionuclide Separation Facilities Product Line:

Work Package DD03: Canyon Disposition Initiative - The U-Plant Facility is one of five "canyon" facilities at the Hanford Reservation. The canyon has a mix of processing cells which have been inactive for a long time. This work package will demonstrate and deploy technologies for accurate characterization to determine the type, quantity and location of contamination to support development of a Record of Decision that will determine the final end-state of the U-plant facility. Without this project, DOE will not have the characterization data needed to complete the CERCLA RI/FS study for the U-plant to determine the most cost effective end-state for the facility. This work package is applicable to the other four canyon facilities at Hanford as well as similar canyon and fuel reprocessing facilities at Savannah River (F and H Canyons), Idaho (ICPP) and Oak Ridge (Y-12). Many of these facilities have been excluded from the 2006 Plan, because of the high cost of D&D and lack of a clearly defined path to a preferred final end state. Site-specific needs addressed by this work package are listed in Appendix A.

Work Package DD05: Scrap Metal Recycling and Release - All D&D activities lead to potentially valuable contaminated scrap metal. At present most of these metals are disposed of as waste since no cost-effective technologies exist to characterize and/or decontaminate them for free release. This work package will demonstrate and deploy technologies to characterize, separate (contaminated and non-contaminated portions), and decontaminate metals for recycle or free release. This will result in substantial life-cycle cost savings to DOE. Without this effort, most of the metals generated during D&D will be disposed of as low-level waste at typically high life-cycle cost. Every DOE site will benefit from the results of this work package, especially Oak Ridge, Portsmouth, Paducah, Rocky Flats and Savannah River. Site-specific needs identified in this work package are listed in Appendix A.

Work Package DD08: D&D of Separation Process Facilities - Separation process facilities represent the greatest number of facilities facing D&D in the DOE weapons complex. Such facilities include chemical separations and enrichment operations designed primarily to produce plutonium and uranium. These aging structures are typically massive in size with high levels of contamination. Removal and disposition of radioactive and hazardous materials and equipment, deactivation of non-essential systems and utilities, and reconfiguration of systems to facilitate long-term surveillance and maintenance within these facilities with baseline technologies is very costly and poses high safety and health risks. This work package will demonstrate and deploy technologies that address characterization of specific contaminants, large-scale decontamination and dismantlement, waste disposition, worker health and safety, and remote operations. Specific application sites are located at Idaho, Rocky Flats, Hanford, Oak Ridge and Savannah River. Site-specific needs identified in this work package are listed in Appendix A.

C) Fuel and Weapons Component Fabrication Facilities Product Line

Improved and innovative technologies are required to deactivate and decommission fuel and weapons component fabrication facilities including uranium milling and refining facilities, fuel and target fabrication facilities, weapons component fabrication facilities and weapons assembly, dismantlement, modification and maintenance facilities. The following work packages are included in the Fuel and Weapons Component Fabrication Facilities Product Line:

Work Package DD01: D&D of Tritium Contaminated Facilities - DOE's Mound site has many structures contaminated with tritium. This work package will demonstrate and deploy safer, more efficient and cost effective innovative and improved technologies through an ongoing LSDDP. Technologies in the area of building characterization, decontamination/dismantlement and metal/concrete waste disposal/recycling will have validated cost and performance, so that they can be readily deployed in D&D projects at Mound and other sites including Los Alamos National Laboratory, Pantex, Savannah River, and the Princeton Plasma Physics Laboratory. Without these technologies, EM-40 will be forced to adhere to original technical baselines that will increase the risk to workers and increase the cost of D&D. This work package offers approximately \$25 million in potential cost savings and mortgage reduction at Mound. Site-specific needs addressed by this work package are listed in Appendix A.

Work Package DD11: Deactivation of 321-M Fuel Fabrication Facility at the SRS - The 321-M facility was used to manufacture fuel and target assemblies for irradiation in the SRS's production reactors. This facility is currently in post-shutdown S&M phase. An estimated 1,200 grams of highly enriched uranium (HEU) remains in the ventilation ducts, the processing systems and on open surfaces. This work package will demonstrate and deploy improved/innovative technologies to remove residual HEU that will permit DOE to complete stabilization of the facility and will reduce the ongoing costs of S&M and Material Control and Accountability (MC&A). Reduced S&M and MC&A requirements during post-deactivation S&M phase can be directly translated into a commensurate surplus facility mortgage reduction. This work package offers approximately \$20 million in potential cost savings and mortgage reduction. Site-specific needs addressed by this work package are listed in Appendix A.

Work Package DD12: D&D of Weapons Components Fabrication Facilities - Weapons components fabrication facilities include target fabrication facilities, weapons components

fabrication and weapons assembly, dismantlement modification and maintenance facilities. These facilities represent some of DOE's most contaminated facilities; including facilities that contain highly fissile materials, and many facilities contaminated with numerous radioactive species, organics and high explosive materials. Many of these contaminants are extremely mobile, and if left unchecked pose a risk to the environment and surrounding communities. Due to the nature of many of these contaminants the cost of conducting S&M, and Material Control and Accountability are exorbitant. This work package will develop, demonstrate and deploy improved technologies and systems for characterization, decontamination and dismantlement that will significantly reduce the risk to workers, the public, and the environment. Applicable sites include Pantex, Rocky Flats, SRS, NTS and LANL. Site-specific needs identified in this work package are listed in Appendix A.

D) Laboratory Facilities Product Line

Innovative and improved technologies are required to D&D laboratory facilities including research, development and testing facilities, hot cells and gloveboxes. The following work packages are included in the Laboratory Facilities Product Line:

Work Package DD13: Oversize Metallic TRU Waste Disposition at LANL - Across the DOE weapons complex, there is a large number of surplus Pu-contaminated processing equipment, including piping, ducts, tanks and gloveboxes. This work package will demonstrate and deploy cost-effective technologies for characterization, segregation (TRU vs. LLW) and packaging of TRU contaminated waste. This will minimize amount of waste that will be disposed as TRU waste resulting in significant cost savings. This work package offers approximately \$75 to \$180 million in potential cost savings and mortgage reduction. Applicable sites include LANL and Rocky Flats. Site-specific needs identified in this work package are listed in Appendix A.

Work Package DD07: D&D of Laboratory Facilities - Laboratory facilities, including contaminated hot cells and gloveboxes, are typically contaminated with high levels of radioactivity and often require remote/robotic applications to reduce worker exposure risk. In addition, working space is often confined, which also results in increased risk. This work package will demonstrate and deploy remote and robotic technologies for characterization, decontamination, dismantlement and waste packaging that will result in much lower costs and risks. Without this effort, baseline D&D approaches will be followed at most sites at very high cost to DOE. Applicable sites include Savannah River, INEEL, Sandia National Laboratory, General Atomics Hot Cell Facility (San Diego, CA), General Electric (Vallecitos, CA), and the Laboratory for Energy-Related Health Research. Site-specific needs identified in this work package are listed in Appendix A.

III. Critical Technologies/Projects

- A) Oversize Metallic TRU Waste Disposition at LANL LSDDP #4 - This LSDDP (**TTP# AL0-8-DD-21**) will demonstrate improved and innovative technologies for the characterization, decontamination, dismantlement/size reduction, segregation, packaging, and preparation for disposal at WIPP of TRU waste at LANL. LANL currently has 2, 400 cubic meters (cm) of TRU waste in inventory and expects to generate another 3,000 cm from ongoing operations in coming years. It is anticipated that the LSDDP will reduce TRU volume by greater than 75 percent. The LSDDP will demonstrate technologies in parallel with the baseline approach being deployed at LANL through the Accelerated Site Technology Deployment (ASTD) project. The ASTD project (**TTP# AL0-8-SD-10**) will deploy the industrial process Decontamination and Volume Reduction System (DVRS). DVRS is an integrated system that will be used to assay, contain, decontaminate, and reduce the volume of oversized, metallic TRU waste which is currently stored in non-WIPP certifiable packaging configurations. The LANL LSDDP plans to demonstrate 10-12 competing technologies during the period from March 1998 through completion in September 2000.
- B) Mound Tritium D&D LSDDP #5 - This LSDDP (**TTP# OH0-8-DD-21**) will demonstrate and deploy innovative technologies capable of expediting the cleanup process and accelerating the schedule for the D&D of tritium facilities at MEMP (Miamisburg Environmental Management Project). This project will also impact planned D&D of tritium contaminated facilities at the Savannah River Site and Pantex. Candidate technologies for demonstration will address one of the following targeted needs:

- removal of gloveboxes
- tritium characterization and surface quantification
- productivity improvements
- tritium specialties decontamination
- piping system removal and disposition
- mixed waste treatment and disposal
- tritiated water treatment
- rad/non-rad building material disposition

This project will conduct a minimum of 10 to 12 technology demonstrations in FY99, with a goal of 20 to 25 demonstrations completed within 31 months. This project was initiated in March 1998 and has a projected end date of September 2000.

- C) Deactivation of 321-M Fuel Fabrication Facility at the Savannah River Site LSDDP #6 - The SRS 321-M Fuel Fabrication Facility is contaminated with an estimated 1,200 grams of highly enriched uranium (HEU). The SRS LSDDP (**TTP # SR0-8-DD-21**) will demonstrate improved/innovative that support planned deactivation activities. By removing HEU, ongoing surveillance and maintenance (S&M) costs and costs associated with material control and accountability will be reduced. A reduction in the facility's contaminated are will also make eventual decommissioning easier and less expensive. The LSDDP will demonstrate a minimum of 8 to 10 technologies in the areas of characterization, decontamination, stabilization, and dismantlement/removal. The project was initiated in March 1998 and demonstrations are scheduled for completion in September 1999.
- D) Fuel Storage Canals and Associated Facilities D&D LSDDP #7 - This LSDDP will demonstrate innovative/improved technologies in the broad areas of inspection, characterization, decontamination, and dismantlement of the Common Water Canal at Test Reactor Area (TRA) 660 Building, the TRA-Filter Pits and Test Area North (TAN) Building 620 at the INEEL. These facilities offer a wide range of opportunities for remote technology applications, underwater applications, and confined space applications. The Technical

Task Plan (**TTP# ID0-8-DD-21**) identifies 25 specific problem areas where innovative technologies may be demonstrated. Beginning in FY99, this LSDDP will also receive support from the Robotics Technology Development Program (RTDP) D&D teams from Idaho (**TTP# ID7-9-C1-13**) and Oak Ridge (**TTP# OR0-9-C1-13**). The multisite Robotics team will direct support to the DDFA through the definition, development, and deployment of remote D&D systems. The goal of this LSDDP is to demonstrate of 16 to 18 improved and innovative D&D technologies. This project was initiated in March 1998 and has a projected end date of September 2000.

- E) Canyon Disposition Initiative - The purpose of this project (**TTP # RL0-8-DD-21**) is to demonstrate and deploy innovative characterization technologies to support the detailed analysis, including performance assessment, of final disposition alternatives for the Hanford 221-U Plant “canyon” facility. This project will support a Record of Decision (ROD), as well as identify alternative technologies to be considered in the ROD for operation and closure of the facility that may result in as much as \$1 billion savings. Characterization technologies that will be required for the CDI Project include:

- remote/robotic technologies
- visual/spatial imaging
- radiation survey
- detection of freestanding liquids
- liquid characterization
- solids (sediments/sludge/dust) characterization
- concrete characterization

The overall coordination of the CDI Project will include multiple EM offices including EM-30, EM-40, EM-60 and EM-50. EM-50 support will be provided from the DDFA as well as the Robotics and Characterization, Monitoring and Sensor Crosscut Programs. The RTDP D&D team is providing technical support in the areas of remote inspection and sampling. In FY99, the RTDP team will support remote sample collection/characterization activities of the canyon process cells. The sampling activities will use available remote systems integrated with appropriate characterization systems. This effort is supported through (**TTP # RL3-8-C1-11**). This CDI Project was initially funded in March 1998 and has an expected completion date of September 1999.

- F) Rocky Flats D&D Initiative - The DDFA will deploy multiple technologies at Rocky Flats for the removal, size reduction, packaging and characterization of Pu-contaminated gloveboxes and tanks. This work is critical to Rocky Flats being able to develop and implement a technical baseline for site closure in FY2006 (the current technical baseline shows closure in FY2010). To achieve closure in FY2006, multiple Pu laboratory buildings will undergo D&D simultaneously in the FY2001-2006 period, rather than sequentially as in the FY2010 closure plan. In FY99, Rocky Flats received \$900K funding (TTP# RF-09-DD-71) for two tasks: 1) Task 1 (\$300K) deploys new manual cutting tools in FY99 (matched with \$1M site funding) to increase D&D productivity and decrease risks to the D&D workers, 2) Task 2 (\$600K) is the first year's funding of a three-year project (\$6M DDFA; \$6M site funding) for a central size reduction facility which is required by FY2001 when D&D of multiple buildings will start occurring. This work is closely coordinated with the first Rocky Flats ASTD project (TTP# RF-08-SD-10), and the new Rocky Flats FY99 ASTD project (remotely operated robotic arm with tooling, installed in a Permacon enclosure) for size reduction and packaging.

- G) Accelerated Site Technology Deployments -

1. Existing ASTD Projects - The D&D ASTD projects will deploy multiple D&D technologies/technology systems across the DOE weapons complex. In FY99, three ASTD projects will deploy technologies at LANL, Rocky Flats, and INEEL/FEMP. These projects include: the

Decontamination and Volume Reduction System (**TTP# AL0-8-SD-10**) for treatment, packaging and disposal of TRU waste at LANL; the ASTD Glovebox Project at Rocky Flats (**TTP# RF0-8-SD-10**) for enhanced in situ decontamination and size reduction system of gloveboxes; and the Integrated D&D project (**TTP# ID0-8-SD-11**), which will deploy a series of innovative and improved D&D technologies at INEEL and FEMP. These technologies will result in significant cost savings immediately at the deployment sites. Without these technologies, baseline technologies will have to be used at significantly higher cost and worker exposure risks.

2. New ASTD Projects - Eleven additional ASTD projects were selected in November, 1998 for deployment in the FY1999-2000 period:

- Deployment of Highly Selective Nuclide Removal System; SRS
- Deployment of the Mobile Work Platform; Fernald
- Drum Bubbler Tritium Processing System; PPPL
- Deployment of the Brokk Remote Concrete Demolition System; ANL/INEEL
- Remote Size Reduction and Decontamination in Large Hot Cells by Deploying Robotic Technologies; Hanford
- Ovrsize TRU Waste Laser Cutting and Electrolytic Decontamination; NTS
- Accelerated Closure of Bldg. 771 Using Remote/Robotic Technology; Rocky Flats
- Reuse of Concrete for Recycle from Decontamination and Decommissioning Projects; INEEL
- Providing the Personal Ice Cooling System; Fernald
- Deployment of Innovative Characterization Technologies and Implementation of the MARSSIM Process at Radioactively Contaminated Sites; EML/BNL
- A Position-Sensitive Radiation Monitoring System for Surveying Floors in Industrial Areas; NTS

IV. Major Technical Milestones/Objectives

Complete at least two technology demonstrations (TTP# AL0-8-DD-21)	09/99
Deploy DVRS (TTP# AL0-8-SD-10)	08/99
Complete a minimum of two Set A (characterization) technology demonstrations (TTP# OH0-8-DD-21)	02/99
Complete a minimum of two Set B (decon & waste handling) technology demonstrations (TTP# OH0-8-DD-21)	10/99
Begin technology demonstrations (TTP# SR0-8-DD-21)	11/98
Complete at least five technology demonstration (TTP# SR0-8-DD-21)	09/99
Complete a minimum of seven technology demonstrations (TTP# ID0-8-DD-21)	09/99
Complete TRA filter pit D&D system design (TTP# ID7-9-C1-13 & OR0-9-C1-13)	09/99
Complete assessment of engineering (post-ROD) technologies (TTP# RL0-8-DD-21)	09/99
Complete remote system and sensor integration (TTP# RL3-8-C1-11)	06/99
Demonstrate/Deploy five technologies for Canyon Facility characterization	

V. Significant Publications

Each technology demonstrated within an LSDDP will have the following documents published:

- Demonstration Fact Sheet (approx. 2 to 4 weeks following demonstration)
- Detailed Technology Report (approx. 60 to 90 days following demonstration)
- Innovative Technology Summary Report (approx. 90 to 120 days following demonstration)

Each LSDDP will also be required to maintain an up-to-date website for communication of project activities and progress, as well as individual technology demonstration summary fact sheets.

The DDFA will work closely with the ASTD projects to assist them in creating web sites, deployment fact sheets (approx. 60-90 days following deployment), and Cost and Performance Reports (90-120 days following deployment; EM-40 format).

In addition to these technology/project specific documents, the DDFA will provide documentation as required for the following items as determined by the Headquarter's master schedule currently being developed as part of the Business Process Redesign efforts.

- Focus Area Technical Response and Site Needs Assessment
- Technical Gap Analysis
- Input to Annual Report to Congress
- Technology Summary Sheets
- Deployment Fact Sheets
- Program Technology Summary Sheets
- Success Stories including the DDFA Annual Report

VI. Performance Metrics

The following metrics, based on the guidance provided by headquarters, reflect STCG Technical needs data that were generated prior to FY99 (in fact most referenced data sources, as per guidance, are pre-FY98) and as such will not accurately reflect the true measure of the DDFA's planned success. For an estimate of planned demonstrations and deployments sponsored by the DDFA in FY99, see Appendix B.

- 1) 92% of needs assigned to the DDFA that are rated as "high" priority by end-users are being addressed.

Calculation: 24 needs being addressed / 26 "high" priority rated needs

Based on a total of 92 technical needs assigned to focus area with 26 rated as "high" priority

- 2) 16% of all DDFA needs are rated as "high" priority by end-users and have a technology rating of "1" or "2" in the Linkage Tables.

Calculation: 15 "high" priority needs with a rating of "1" or "2" / 92 technical needs

Based on a total of 92 technical needs assigned to focus area with 26 rated as "high" priority

Note: "D" rated technologies in the ODS Table 1 of the January 16 ACPTC submission were included as ratings "1" or "2". Also, of the 11 "high" priority needs not included in this metric (i.e., those not rated "1" or "2"), 5 were new needs in FY98 and were not included in Linkage or ODS Tables and technology solutions for 3 needs submitted in FY97 were never rated by the sites in either the Linkage or ODS Tables.

Performance Metric responses #3 through #6 below, were calculated using the total number of solutions being developed by the focus area as the denominator. For the DDFA this number is quite dynamic due to the large number of technologies being demonstrated within the LSDDPs. As of June 29, 1998, the EM-50 Technology Management System (TMS) reflected a total of 116 Activity "1" and "2" technologies (includes 35 Crosscut/Industry Program technologies).

3) Percent of focus area solutions that end-users included in PBS.

Of the 116 technologies in the DDFA portfolio as of June 29, 1998, approximately 65 of these technologies were included as candidate technologies in the ODS Tables of the ACPTC. These 65 technologies were the only technologies considered by the sites during the January 1998 submittal of the ACPTC. The following metrics are based on the January 1998 ODS Tables. For a more accurate estimate of planned demonstrations and deployments by the DDFA in FY99, refer to Appendix B.

Expected Deployments based on ODS Table 1.

FY1999 metric based on 65 possible technology solutions = $3/65 = 5\%$

FY2000 metric based on 65 possible technology solutions = $11/65 = 15\%$

Potential deployments listed in ODS Table 1.

FY1999 metric based on 65 possible technology solutions = $19/65 = 29\%$

FY2000 metric based on 65 possible technology solutions = $38/65 = 58\%$

4) Percent of focus area solutions that end-users included in at least one compliance agreement, Environmental Impact Statement, ROD, etc.

Information not available at this time

5) Percent of focus area solutions that end-users included in at least one facility configuration, operating procedure, etc.; or have established a procurement contract for the solution.

Information not available at this time

6) Percent of focus area solutions that end-users at more than one site included in at least one facility configuration, operating procedure, etc.; or have established a procurement contract for the solution.

Information not available at this time

7) Number of technologies ready for implementation with cost and performance data

The DDFA has conducted 56 full-scale technology demonstrations as part of its first three LSDDPs. ITSRs will be written with full cost and performance data for all but three of these demonstrations. In FY98, 46 ITSRs were submitted to headquarters for publication and twelve were published. Camera ready ITSRs for the remaining technologies demonstrated in the first three LSDDPs will be submitted to headquarters by the end of the first quarter 1999. Data is available in EM-50's TMS to track ITR status information.

Numbers of technologies ready for implementation in FY99 and beyond is a function of the number of technologies demonstrated that show successful cost and performance over baseline technologies. An estimate of technologies to be demonstrated in FY99 can be found in Appendix B.

8) Number of technologies demonstrated.

See Appendix B

VII. Technology Gate Progressions

DDFA technologies demonstrated in the LSDDPs are most often commercially available and are post-gate six. Gate information for technologies being developed by Crosscut Programs, including the Industry and University programs is available in TMS.

VIII. Peer Review Schedule

See TMS for technology gate review schedules for technologies within the Crosscut and Industry and University Programs. The DDFA will conduct its annual Mid-Year Review, which consists of programmatic review of DDFA technologies and projects (i.e., LSDDPs)

IX. Major Planning Documents

The DDFA prepares Multi-year Program Plans and Annual Performance Plans as per the requirements and schedule of EM-50 Headquarters. Other planning documents developed by the focus area according to EM-50's Master Budget and Execution Schedule include Annual Performance Metrics. Program Execution Guidance and Internal Review Budgets. DDFA also provides input to the EM-50 R&D Plan, as well as to EM-50's submission of the OMB budget and Annual Reports to Congress.

X. Program-Sponsored Conferences, Workshops, or Stakeholder Activities

Tenth National Technology Information Exchange Workshop	10/99
Waste Management '99	3/99
DDFA Mid-Year Review	5/99
American Nuclear Society DD&R Meeting	9/99

Appendix A - D&D Work Packages Crosswalked to PBSs and Site Technology Needs

This appendix has been provided as an alternative to the original Annual Performance Plan guidance, which required that each work package listed in Section II "Major Technical Focus For FY 1999-2001" contain information on specific technical needs the work package addresses. The relationships between work packages and site technical needs is derived through a two-step process that includes 1) establishing relationships between DDFA Work Packages and the site's ACPTC projects as referenced in their Project Baseline Summaries (PBSs) and 2) identification of the relationship between PBSs and site needs as reported in the ACPTC Office/Field Data Summary (ODS) Table 2. The needs listed in this appendix do not necessarily reflect all needs mapped through PBSs to a particular work package, but rather those needs that highlight the most serious problems which the focus area intends to address through projects funded within the stated work package. Detailed information of PBSs for each work package are available in the DDFA Multi-Year Program Plan.

PRODUCT LINE: Reactor Facilities

Work Package DD02: Fuel Storage Pool & Associated Facilities D&D – LSDDP #7

PBS No.

ID-ER-110

RL-TP09

SR-FA13

SR-FA22

PBS Title

Decontamination & Dismantlement (D&D)

K Basin Deactivation

RBOF Deactivation Project

RBOF Monitoring Project

Site Need No.

ID-7.2.03

ID-7.2.04

ID-7.2.05

ID-7.2.06

ID-7.2.07

ID-7.2.08

ID-7.2.09

RL-DD012

RL-DD013

RL-DD014

RL-DD015

SR-4001

SR-4002

SR-4003

SR-4004

SR-4005

SR-4006

SR-4007

SR-4008

SR-4009

SR-4010

Need Title

Concrete Decontamination

Metal Decontamination

Waste Recycle

Remote Characterization

Remote Demolition

Robotic Tooling to use multiple end effectors

Develop a Rapid Wood Radiological Contamination Monitor

Contaminant Mapping of K-Basin

Decontamination of K-Basin Pool

Fixatives for K-Basin

Improved Decontamination Techniques for Concrete Fuel Storage Basins

Dismantlement of Large and/or Complex Equipment & Structures

Characterization of Contaminated Surfaces

Material Recycle (process equipment, metal, steel, and concrete)

Decontamination of Contaminated Concrete

Characterization of Inaccessible Areas

Asbestos Treatment to Allow Reuse

Characterization of Volumetrically Contaminated Surfaces

Dismantlement of Concrete-Encased Piping

Improved Exhaust Treatment Systems

Characterization Data Management

PRODUCT LINE: Reactor Facilities
Work Package DD10: Production Reactor D&D

<u>PBS No.</u>	<u>PBS Title</u>
RL-ER06	Decontamination & Decommissioning
RL-ER05	Facility Surveillance & Maintenance
RL-TP11	Advanced Reactors Transition
SR-FA08	P Reactor Deactivation Project
SR-FA09	C Reactor Deactivation Project
SR-FA10	R Reactor Deactivation Project
SR-FA11	K Reactor Deactivation Project
SR-FA12	L Reactor Deactivation Project
SR-FA20	Reactors Monitoring Project
CH-ANLEDD	Argonne National Laboratory - East D&D Actions
CH-PPPLWO	Princeton Plasma Physics Laboratory Waste Operations
CH-BRNLDD	Brookhaven National Laboratory D&D Actions
OR-43201	Melton Valley D&D
<u>Site Need No.</u>	<u>Need Title</u>
RL-DD018	Reactor Core Stabilization
RL-DD019	Physical Stress Monitors
RL-DD020	Bio-control Technologies
RL-DD021	Metal Decontamination and Recycling
RL-DD022-S	Photon-Assisted Decontamination Chemistry
RL-DD024-S	Colloidal Chemistry of Basin Wastes
RL-DD025-S	Effluent Capture
RL-DD026-S	Contaminant Binding Science Need
SR-4001	Dismantlement of Large and/or Complex Equipment & Structures
SR-4002	Characterization of Contaminated Surfaces
SR-4003	Material Recycle (process equipment, metal, steel, and concrete)
SR-4004	Decontamination of Contaminated Concrete
SR-4005	Characterization of Inaccessible Areas
SR-4006	Asbestos Treatment to Allow Reuse
SR-4007	Characterization of Volumetrically Contaminated Surfaces
SR-4008	Dismantlement of Concrete-Encased Piping
SR-4009	Improved Exhaust Treatment Systems
SR-4010	Characterization Data Management
CH-0011	Lead Removal, Segregation And Disposal
CH-0012	Decontamination of Exterior Fixed Surface Contamination of The 310 Retention Tanks
CH-0013	Spent Fuel Pool Water Processing
CH-0014	Metal Decontamination (Tank Internals)
CH-0015	Improved Worker Protection Equipment
CH-0016	Size Reduction of Large Concrete Structures
CH-0017	Size Reduction of Massive Metal Structures
CH-0018	Improved Waste Packaging for Remote Handled Waste
CH-0019	Standardized Robotics Tooling
CH-0020	Decontamination of Fixed Surface Contamination of Concrete (Thin Layer Removal)
CH-0021	Cutting/Dismantling Devices for Segmenting the TFTR Vacuum Vessel & Toroidal Field Coils
CH-0022	Characterization for Decontamination/Decommissioning

PRODUCT LINE: Radionuclide Separation Facilities
Work Package DD03: Canyon Disposition Initiative

<u>PBS No.</u>	<u>PBS Title</u>
RL-ER06	Decontamination & Decommissioning
RL-TP01	B-Plant Sub-Project
SR-FA02	F Canyon Deactivation Project
SR-FA03	FB Line Deactivation Project
SR-FA04	H Canyon Deactivation Project
SR-FA05	HB Line Deactivation Project
SR-FA07	Old HB Line Deactivation Project

<u>Site Need No.</u>	<u>Need Title</u>
RL-DD015	Improved Decontamination Techniques for Concrete Fuel Storage Basins
RL-DD016	Characterization Technologies for Materials Processing Facilities
RL-DD017	Segregation Characterization (contaminated vs. Non-contaminated & TRU vs. Non-TRU)
RL-DD019	Physical Stress Monitors
RL-DD021	Metal Decontamination and Recycling
RL-DD022-S	Photon Assisted Decontamination Chemistry
RL-DD023-S	Cesium Leak Dispersion Properties
RL-DD024-S	Colloidal Chemistry Of Basin Wastes Cesium Leak Dispersion Properties
RL-DD025-S	Effluent Capture
RL-DD026-S	Contaminant Binding Science Need
SR-4001	Dismantlement of Large and/or Complex Equipment & Structures
SR-4002	Characterization of Contaminated Surfaces
SR-4003	Material Recycle (process equipment, metal, steel, and concrete)
SR-4004	Decontamination of Contaminated Concrete
SR-4005	Characterization of Inaccessible Areas
SR-4006	Asbestos Treatment to Allow Reuse
SR-4007	Characterization of Volumetrically Contaminated Surfaces
SR-4008	Dismantlement of Concrete-Encased Piping
SR-4009	Improved Exhaust Treatment Systems
SR-4010	Characterization Data Management

PRODUCT LINE: Radionuclide Separation Facilities
Work Package DD05: Scrap Metal Recycling and Release

<u>PBS No.</u>	<u>PBS Title</u>
OR-44302	ETTP (K-25) Process Equipment D&D
OR-45301	Paducah Remedial Action
OR-46301	Portsmouth Remedial Action
NV214	Industrial Sites
RF014	Industrial Zone Closure Project
RF015	Misc. Production Zone Cluster Closure Project
RF016	Building 371 Cluster Closure Project
RF017	Building 707/750 Cluster Closure Project
RF018	Building 771/774 Cluster Closure Project
RF019	Building 776/777 Cluster Closure Project
RF020	Building 881 Cluster Closure Project
RF021	Building 991 Cluster Closure Project
RF022	Building 779 Cluster Closure Project
<u>Site Need No.</u>	<u>Need Title</u>
OR-DD-01	Improved Characterization of Equipment and Facilities
OR-DD-02	Improved Decontamination of Metal Process Equipment
OR-DD-04	Improved Technology for the Recycle of Contaminated Resources
OR-DD-06	Improved Remote Decontamination Methods
OR-DD-09	Improved Non-Thermal Cutting of Process Equipment
OR-BS-16	Improved Radiological Characterization and Certification of Contaminated Equipment and Facilities
OR-BS-17	Improved Decontamination Techniques for Process Equipment and Facilities
NV10-9801-10	Improved Detection & Characterization of Large Metal & Concrete Surfaces
NV06-9801-13	Improved Decontamination of Large Metal & Concrete Surfaces
NV09-9801-15	Nonintrusive Surveys in Pipes And Vessels
RF-DD01	Characterization of Contaminated Surfaces (TRU vs. Low Level)
RF-DD02	Characterization of Contaminated Surfaces (Low Level vs. Free Release)
RF-DD03	Airborne Particulate Control
RF-DD04	Characterization for Free Release of Property and Salvageable Equipment
RF-DD08	Worker Protection Clothing and Systems
RF-DD10	Decontamination of Non-Porous Surfaces
RF-DD11	Size Reduction of Contaminated Equipment and Demolition Waste
RF-DD12	Improved Technology for Recycling Radioactively Contaminated Scrap Metal

PRODUCT LINE: Radionuclide Separation Facilities
Work Package DD08: Separation Process Facilities D&D

<u>PBS No.</u>	<u>PBS Title</u>
CH-ANLWRA	Argonne National Laboratory-West Remedial Actions
ID-ER-110	Decontamination & Dismantlement (D&D)
OR-42101	Y-12 East Fork Poplar Creek Remedial Action
OR-43204	Bethel Valley D&D
OR-44303	ETTP (K-25) D&D
OR-63201	Nuclear Material and Facility Stabilization
RL-TP10	Accelerated Deactivation
SP-SPRU	Separations Process Research Unit
SR-FA14	D Area Deactivation Project
SR-FA16	F-Area Monitoring Project
SR-FA17	H-Area Monitoring Project
SR-FA19	D Area Monitoring Project

<u>Site Need No.</u>	<u>Need Title</u>
ID-7.2.03	Concrete Decontamination
ID-7.2.04	Metal Decontamination
ID-7.2.05	Waste Recycle
ID-7.2.06	Remote Characterization
ID-7.2.07	Remote Demolition
ID-7.2.08	Robotic Tooling to use multiple end effectors
ID-7.2.09	Develop a Rapid Wood Radiological Contamination Monitor
OR-BS-16	Improved Radiological Characterization and Certification of Contaminated Equipment and Facilities
OR-BS-17	Improved Decontamination Techniques for Process Equipment and Facilities
OR-DD-01	Improved Characterization of Equipment and Facilities
OR-DD-02	Improved Decontamination of Metal Process Equipment
OR-DD-03	Improved Decontamination of Facility Concrete and Painted Surfaces
OR-DD-04	Improved Technology for the Recycle of Contaminated Resources
OR-DD-06	Improved Remote Decontamination Methods
OR-DD-07	Remote Dismantlement Methods
OR-DD-08	Decontamination of Mercury Contaminated Metal and Porous Surfaces
OR-DD-09	Improved Non-Thermal Cutting of Process Equipment
OR-DD-10	Improved Asbestos Disposition

PRODUCT LINE: Fuel and Weapons Components Fabrication
Work Package DD01: D&D of Tritium Contaminated Facilities – LSDDP #5

<u>PBS No.</u>	<u>PBS Title</u>
AL009	LANL ER
OH-MB-01	Tritium Operations
OH-MB-02	Main Hill Tritium
OH-MB-04	Main Hill Rad
OH-MB-06	S&M/PP Hill
SR-ER08	Facility Disposition Program Planning

<u>Site Need No.</u>	<u>Need Title</u>
AL-07-01-12-DD	New Technologies to Decontaminate and Decommission Radioactively Contaminated Facilities
AL-07-01-13-DD	Technologies for Difficult Access Interior Contamination
OH-M002	Tritiated Pump Oils
OH-M004	Improved facility survey techniques
OH-M005	Method for controlling removable tritium contamination inside piping
OH-M007	Portable unit for concrete samples
OH-M008	Apparatus to provide misting of areas while D&D activities are performed
OH-M011	Decontamination Techniques for Tritiated Gloveboxes
OH-M012	Control or Eliminating Off-Gassing from Tritium Process Piping

Work Package DD11: Deactivation of 321-M Fuel Fabrication Facility –LSDDP #6

<u>PBS No.</u>	<u>PBS Title</u>
SR-FA15	M Area Deactivation Project
SR-FA18	M Area Monitoring Project
SR-FA06	235-F Deactivation Project

<u>Site Need No.</u>	<u>Need Title</u>
SR-4001	Dismantlement of Large and/or Complex Equipment & Structures
SR-4002	Characterization of Contaminated Surfaces
SR-4003	Material Recycle (process equipment, metal, steel, and concrete)
SR-4004	Decontamination of Contaminated Concrete
SR-4005	Characterization of Inaccessible Areas
SR-4006	Asbestos Treatment to Allow Reuse
SR-4007	Characterization of Volumetrically Contaminated Surfaces
SR-4008	Dismantlement of Concrete-Encased Piping
SR-4009	Improved Exhaust Treatment Systems
SR-4010	Characterization Data Management

PRODUCT LINE: Fuel and Weapons Components Fabrication
Work Package DD12: D&D of Weapons Components Fabrication Facilities

<u>PBS No.</u>	<u>PBS Title</u>
AL009	LANL Environmental Restoration
AL014	Pantex Plant Site Remediation Project
AL019	Pinellas Plant Close-out Activities
OR-42101	Y-12 E Fork Poplar Creek Remedial Action
OR-43204	Bethal Valley D&D
OH-AB-01	Ashtabula Remediation
OH-FN-01	Facility Shutdown
OH-FN-02	Facility D&D
RF016	Building 371 Cluster Closure Project
RF017	Building 707/750 Cluster Closure Project
RF018	Building 771/774 Cluster Closure Project
RF019	Building 776/777 Cluster Closure Project Management-Legacy Waste
RF020	Building 881 Cluster Closure Project
RF021	Building 991 Cluster Closure Project
RL-TP04	300 Area/SNM Sub-project
RL-TP14	Hanford 300 Area Revitalization
<u>Site Need No.</u>	<u>Need Title</u>
AL-07-01-12-DD	New Technologies to Decontaminate and Decommission Radioactively Contaminated Facilities
AL-07-01-13-DD	Technologies for Difficult Access Interior Contamination
AL-07-06-01-DD	D&D Technology Development
AL-08-06-02-DD	Decontamination of Concrete Surfaces Contaminated w/Radionuclides & High Explosives
OH-F003	Non-Intrusive Location of Buried Items
OH-F010	Safe and Efficient Process Piping and Conduit Dismantlement
OH-F020	Size Reduction of Materials Coated with Lead Based Paint
OH-F027	Improved Equipment Dismantlement
OR-BS-16	Improved Radiological Characterization and Certification of Contaminated Equipment and Facilities
OR-BS-17	Improved Decontamination Techniques for Process Equipment and Facilities
RF-DD01	Characterization of Contaminated Surfaces (TRU vs. Low Level)
RF-DD02	Characterization of Contaminated Surfaces (Low Level vs. Free Release)
RF-DD03	Airborne Particulate Control
RF-DD04	Characterization for Free Release of Property and Salvageable Equipment
RF-DD07	Raschig ring Removal from Tanks
RF-DD08	Worker Protection Clothing and Systems
RF-DD09	Decontamination of Porous Surfaces
RF-DD10	Decontamination of Non-Porous Surfaces
RF-DD11	Size Reduction of Contaminated Equipment and Demolition Waste
RF-DD12	Improved Technology for Recycling Radioactively Contaminated Scrap Metal
RL-DD016	Characterization Technologies for Materials Processing Facilities
RL-DD022-S	Photon Assisted Decontamination Chemistry
RL-DD025-S	Effluent Capture
RL-DD026-S	Contaminant Binding Science Need

PRODUCT LINE: Laboratory Facilities**Work Package DD13: Oversized Metallic TRU Waste Disposition at LANL – LSDDP #4**

<u>PBS No.</u>	<u>PBS Title</u>
AL013	LANL Waste Management – Legacy Waste
OH-WV-02	West Valley Site Transition, Decommissioning & Completion
RF016	Building 371 Cluster Closure Project
RF017	Building 707/750 Cluster Closure Project
RF018	Building 771/774 Cluster Closure Project
RF019	Building 776/777 Cluster Closure Project Management-Legacy Waste
RF020	Building 881 Cluster Closure Project
RF021	Building 991 Cluster Closure Project
RF022	Building 779 Cluster Closure Project
RL-TP05	PFP Deactivation

<u>Site Need No.</u>	<u>Need Title</u>
AL-07-01-14-MW	Characterization of TRU Waste Stored in Fiberglass Reinforced Plywood Boxes for WIPP
AL-08-01-17-DD	Certiifiability of Newly Generated TRU Waste
OH-WV01	CO2 Decontamination Spray Ring
OH-WV03	TRU Characterization, Decontamination, Classification, & Repackaging
RF-DD01	Characterization of Contaminated Surfaces (TRU vs. Low Level)
RF-DD02	Characterization of Contaminated Surfaces (Low Level vs. Free Release)
RF-DD04	Characterization for Free Release of Property and Salvageable Equipment
RF-DD10	Decontamination of Non-Porous Surfaces
RF-DD11	Size Reduction of Contaminated Equipment and Demolition Waste
RL-DD02	Glovebox Volume Size Reduction System
RL-DD03	TRU Waste Decontamination of PFP
RL-DD04	TRU Waste Fixatives for PFP
RL-DD017	Segregation Characterization (contaminated vs. non-contaminated & TRU vs. Non-TRU)
RL-DD022-S	Photon Assisted Decontamination Chemistry
RL-DD023-S	Cesium Leak Dispersion Properties
RL-DD025-S	Effluent Capture
RL-DD026-S	Contaminant Binding Science Need

PRODUCT LINE: Laboratory Facilities
Work Package DD07: Laboratory Facilities D&D

<u>PBS No.</u>	<u>PBS Title</u>
OAK-007	ETEC Remediation
OK-010	LEHR Environmental Remediation
OK-012	Hot Cell Facility D&D at General Atomics
OK-013	General Electric D&D
OR-43204	Bethel Valley D&D
OH-CL-01	King Avenue Site Decontamination
OH-CL-02	West Jefferson Site Decontamination
RL-TP08	324/327 Facility Transition Project
SR-IN13	Decontamination of Lab Facilities 772-F & 773-A

<u>Site Need No.</u>	<u>Need Title</u>
Oakneed11	Determination of End-Point for Cleaning of Piping Systems
Oakneed12	A Process to Decontaminate Lead for Recycle
Oakneed15	Piping Decontamination and Free Release (Radioactive)
Oakneed17	Criteria to Define Rational Pipe Segments for WVN Cleaning
OR-BS-16	Improved Radiological Characterization and Certification of Contaminated Equipment and Facilities
OR-BS-17	Improved Decontamination Techniques for Process Equipment and Facilities
RL-DD05	Characterization of Building 324
RL-DD06	Decontamination of Building 324
RL-DD07	Fixatives for Building 324
RL-DD08	Remote Cutting Technologies
RL-DD09	Tank Remediation for Building 324
RL-DD010	Radiation Hardened Robotics
RL-DD011	Structural Integrity Inspection Technologies
RL-DD022-S	Photon Assisted Decontamination Chemistry
RL-DD023-S	Cesium Leak Dispersion Properties
RL-DD025-S	Effluent Capture
RL-DD026-S	Contaminant Binding Science Need